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Date of Transmission: Oct 6, 2005 By: Stuart Whittington

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Bruce Rose et al. Atty. Docket No: 42390.P12398

Appln. No.: 10/039,461 Group Art Unit: 2682

Filed: December 28, 2001 Examiner: Milord, Marceau

Title: PORTABLE COMMUNICATION DEVICE HAVING A MEMS SWITCH AND METHOD THEREFOR

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BRIEF ON APPEAL

Pursuant to Appellant's Notice of Appeal filed on July 26, 2005, Appellant presents this Brief in appeal of the Final Rejection dated January 25, 2005.

I. REAL PARTY IN INTEREST.

Intel Corporation is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES.

There are no related appeals or interferences before the Board of Patent Appeals and Interferences or related judicial proceedings known to Appellant, the Appellant's legal representatives, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS.

Claims 1-20 were presented in the application. Claims 1, 6, 11 and 18-20 have been cancelled leaving claims 2-5, 7-10 and 12-17 as the only pending claims remaining. Claims 2-5, 7-10 and 12-17 stand finally rejected and are the claims subject to this appeal, which are reproduced in Appendix A.

IV. STATUS OF AMENDMENTS.

No amendments have been submitted subsequent to the Final Office Action of January 26, 2005 and all prior amendments are believed to have been entered into the record.

V. SUMMARY OF CLAIMED SUBJECT MATTER.

Embodiments of the instant invention relate to a portable communication device 50 (Fig. 1) such as a cell phone, two-way radio, portable computer and the like. Device 50 may include a plurality of transceivers or baseband modules 21-24 used to process communication signals associated with different frequencies or protocols. (Specification pg. 5, ll. 1-12). The baseband modules 21-24 may be connected to an antenna 58 via a microelectromechanical system (MEMS) switch bank 80 and field effect transistors (FET) transmit/receive switches 30. (Spec. pg. 6, ll. 11-19).

Mechanical switches, such as MEMS switches 81-84, due to their mechanical switching nature, may provide complete physical isolation in the signal path between antenna 85 and the corresponding baseband module 21-24, which in turn provides excellent isolation and low insertion loss. This results in portable communication device 50 having less attenuation or signal

loss thereby consuming less power and having longer battery life. (Spec. pg. 7, ll. 12-16). However, the switching time and switching lifetime reliability (e.g., switch wear-out) for MEMS switches may be a problematic for applications that require high speed and frequent switching. Thus in one of Appellant's embodiments, one or more solid state switches, such as FET switches 30, which provide fast switching times, are not prone to "wear-out," but have poor isolation and insertion loss characteristics, may be coupled to MEMs switching bank 80 and used to couple and decouple the transmit and receive paths of the corresponding transceiver to antenna 85. (Spec. pg. 7, ll. 17-20).

In this manner, the FETs switches 30 may enable high switching speeds for transmit and receive paths while the MEMs switching bank 80 may provide excellent isolation of antenna 85. Independent claims 7 and 10, and the claims that depend there from, are representative of the foregoing embodiments.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

The only issue for consideration on this appeal are:

A. Whether claims 2-5, 7-10 and 12-17 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,658,264 to Irwin (hereinafter "Irwin") in view of U.S. Patent 6,204,819 to Hayes et al. (hereinafter "Hayes").

VII. ARGUMENT.

A. APPELLANT'S CLAIMS ARE PATENTABLE OVER IRVIN AND HAYES.

LEGAL STANDARD

It is well established that *prima facie* obviousness is only established when three basic criteria are met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991) (MPEP 2144).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary sill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

ARGUMENT

In the instant case Appellant respectfully submits that, even if it were proper to combine the references as suggested, the combination of Irwin and Hayes would still fail to teach or suggest the at least the following limitations of Appellant's claims:

7. .....the first MEMS switch has an input node directly connected to the antennae; and a field effect transistor switch coupled to an output of the first MEMS switch.

10. .....a first field effect transistor switch coupled to the first mechanical switch.

Respectfully, in the Final Office Action of January 26, 2005, there is not even an attempt to show that either cited reference teaches or suggest the use of a FET switch in any respect. Appellant respectfully submits that Irvin and Hayes, taken alone or in combination fail to disclose or suggest the use of a FET switch, and the combination certainly fails to teach or suggest a FET switch coupled to a mechanical (or MEMS) switch as recited in Appellant's independent claims 7 and 10. Appellant's dependent claims also include these novel and non-obvious features by virtue of their dependency on claims 7 and 10.

Accordingly, *prima facie* obviousness has not been established with respect to any of Appellant's claims and the §103 rejection based on Irvin and Hayes should be overturned.

VIII. CONCLUSION.

It is respectfully submitted that in view of the foregoing all of the pending claims are patentable over the cited prior art references, alone or in any combination, and the Board is respectfully requested to overturn the rejections of record and allow this application to issue.

Respectfully submitted,

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APPENDIX A
(Claims on Appeal)

2. (Previously presented) The portable communication device of claim 7, further comprising:

a second transceiver; and

a second MEMS switch to couple the second transceiver to the antennae.

3. (Original) The portable communication device of claim 2, wherein the first transceiver and the second transceiver are adapted to communicate at about 1.9 GHz, 1.8 GHz, or 900 MHz.

4. (Previously presented) The portable communication device of claim 7, wherein the first MEMS switch includes a cantilever adapted to move to a first position to couple the antennae to the first transceiver.

5. (Original) The portable communication device of claim 4, wherein the cantilever of the first MEMS switch is adapted to move to a second position to disconnect the antennae from the first transceiver.

7. (Previously presented) A portable communication device comprising:

a first transceiver;

a first microelectromechanical system (MEMS) switch to couple the first transceiver to an antennae, wherein the first MEMS switch has an input node directly connected to the antennae; and

a field effect transistor switch coupled to an output of the first MEMS switch.

8. (Original) The portable communication device of claim 7, wherein the field effect transistor switch and the first MEMS switch are contained within the same package.

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9. (Original) The portable communication device of claim 8, wherein the field effect transistor switch and the first MEMS switch are contained within the same semiconductor substrate.

10. (Previously presented) A portable communication device comprising:

an antennae;

a first mechanical switch that is enabled with an electrical signal;

a first transceiver, wherein the first mechanical switch is adapted to couple the first transceiver to the antennae;

a second mechanical switch that is enabled with an electrical signal;

a second transceiver, wherein the second mechanical switch is adapted to coupled the second transceiver to the antennae; and

a first field effect transistor switch coupled to the first mechanical switch.

12. (Previously presented) The portable communication device of claim 10, wherein the first field effect transistor switch and the first mechanical switch are both formed in the same semiconductor substrate.

13. (Original) The portable communication device of claim 10, further comprising a first base band module adapted to process signals at a first frequency, the first base band module coupled to the antennae when the first mechanical switch is enabled.

14. (Original) The portable communication device of claim 13, wherein at least a portion of the first base band module and the first mechanical switch are formed on the same semiconductor substrate.

15. (Original) The portable communication device of claim 13, further comprising a second base band module adapted to process signals at a second frequency, the second base band module coupled to the antennae when the second mechanical switch is enabled.

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16. (Original) The portable communication device of claim 15, wherein the first frequency is at least twice the second frequency.

17. (Original) The portable communication device of claim 15, wherein the first frequency is about 1.9 GHz.

APPENDIX B
(Evidence Appendix)

There is no additional evidence relied upon in this Appeal.

APPENDIX C
(Related Proceedings Appendix)

There are no proceedings or decisions related to this Appeal.